

CLAIM AMENDMENTS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A switching node apparatus for use in an optical burst-switched network, comprising:

optical switch fabric, having at least one input fiber port and at least one output fiber port; and

a control unit, operatively coupled to control the optical switch fabric, including at least one processor and a storage device operatively coupled to said at least one processor containing machine-executable instructions, which when executed by said at least one processor perform operations, including:

receiving a resource reservation request to reserve a bandwidth resource provided by the switching node apparatus, said resource reservation relating to a portion of a lightpath comprising a plurality of lightpath segments coupled between network nodes, including incoming and outgoing lightpath segments coupled to an input and an output port of the switching node apparatus, respectively;

reserving the bandwidth resource;

detecting an unavailability of the bandwidth resource after the bandwidth resource has been reserved;

generating a resource cancellation message in response to detecting the unavailability of the bandwidth resource; and

sending the resource cancellation message to at least one network node along the lightpath.

2. (Original) The apparatus of claim 1 wherein execution of the instructions further performs the operations of:

canceling a resource reservation in response to receiving a resource cancellation message.
3. (Original) The apparatus of claim 1, where the optical burst-switched network is a mesh-architecture optical network.
4. (Original) The apparatus of claim 1, further comprising at least one input port to link in communication with one or more edge nodes of the optical burst-switched network.
5. (Original) The apparatus of claim 1, wherein the optical burst-switched network comprises a photonic burst switched (PBS) network.
6. (Original) The apparatus of claim 5, wherein the optical burst-switched network comprises a wavelength-division multiplexed (WDM) PBS network; and the optical switching fabric provides switching of optical signals comprising different wavelengths carried over common fibers that may be respectively coupled to said at least one input fiber port and said at least one output fiber port.

7. (Original) The apparatus of claim 5, wherein the resource reservation request is sent via a PBS control burst, and the resource cancellation message is included as part of a resource cancellation control burst having a format similar to the PBS control burst.
8. (Original) The apparatus of claim 1, wherein reserving the bandwidth resource comprises storing resource reservation data in a resource reservation table.
9. (Original) The apparatus of claim 1, wherein detecting an unavailability of the reserved resource comprises detecting a traffic contention that limits access to the reserved resource.
10. (Original) The apparatus of claim 1, wherein detecting an unavailability of the reserved resource comprises detecting one of a failure of the switching node apparatus or failure of one of the incoming and outgoing fiber links.
11. (Original) The apparatus of claim 1, wherein the resource cancellation message is sent to a network node that is downstream from the switching node apparatus.
12. (Original) The apparatus of claim 1, wherein the resource cancellation message is sent to a network node that is upstream from the switching node apparatus.
13. (Currently Amended) A method, comprising:

reserving, via corresponding resource reservations, network resources at respective network nodes of an optical-switched network, said network nodes are coupled via lightpath segments comprising a lightpath for which the network resources are reserved;

detecting an unavailability of a network resource along the lightpath after the network resource has been reserved;

generating a resource cancellation message identifying network resources that may be released in response to detecting the unavailability of the network resource;

sending the resource cancellation message to at least one network node along the lightpath; and

canceling any resource reservations identified by the resource cancellation message for said at least one network node.

14. (Original) The method of claim 13, where the optical-switched network is a mesh-architecture optical network.
15. (Original) The method of claim 13, where one or more edge nodes are directly connected to at least one switching node of the optical-switched network.
16. (Original) The method of claim 13, wherein the optical-switched network comprises a photonic burst-switched (PBS) network.

17. (Original) The method of claim 16, wherein the optical-switched network comprises a wavelength-division multiplexed (WDM) PBS network.
18. (Original) The method of claim 16, wherein the resource reservation request is sent via a PBS control burst, and the resource cancellation message is included as part of a resource cancellation control burst having a format similar to the PBS control burst.
19. (Original) The method of claim 16, wherein each node is responsible for managing its own resource cancellation messages and releasing its resources.
20. (Original) The method of claim 16, wherein the unavailability of the network resource is detected at a given network node, and the resource cancellation message is sent to all network nodes that are upstream along the lightpath from said given network node.
21. (Original) The method of claim 16, wherein the unavailability of the network resource is detected at a given network node, and the resource cancellation message is sent to all network nodes that are downstream along the lightpath from said given network node.
22. (Original) The method of claim 16, wherein the unavailability of the network resource is detected at a given network node, and the resource cancellation message is sent to all other network nodes that are along the lightpath.

23. (Original) The method of claim 16, wherein the resource cancellation message is generated at a given network node for which wherein the unavailability of the network resource is detected.
24. (Original) The method of claim 16, wherein reserving the network resource comprises storing resource reservation data in a resource reservation table, and wherein canceling the resource reservation comprises one of deleting or invalidating a record in the resource reservation table corresponding to the resource reservation.
25. (Original) The method of claim 16, wherein detecting an unavailability of the reserved network resource comprises detecting a traffic contention that limits access to the reserved resource.
26. (Original) The method of claim 16, wherein detecting an unavailability of the reserved network resource comprises detecting one of a failure of the switching node apparatus or failure of one of the incoming and outgoing fiber links.
27. (Original) The method of claim 16, wherein the resource cancellation message contains data identifying a type of resource unavailability that is detected.
28. (Original) The method of claim 16, wherein the resource cancellation message contains data identifying the node at which the resource unavailability was detected.

29. (Original) The method of claim 16, wherein the resource cancellation message contains data identifying at least one label corresponding to one or more resource reservations that are to be cancelled.
30. (Original) The method of claim 16, wherein the resource cancellation message contains data identifying a lightpath for which resource reservations are to be cancelled.
31. (Original) The method of claim 30, wherein the data identifying the lightpath for which resource reservations are to be cancelled comprises a burst identifier (ID) that matches a control burst ID corresponding to a control burst that was employed to make the resource reservations.
32. (Currently Amended) A machine-readable medium to provide instructions, which when executed by a processor in a switching node apparatus comprising a network node in an optical switched network, cause the switching node apparatus to perform operations comprising:
- receiving a resource reservation request to reserve a bandwidth resource provided by the switching node apparatus, said resource reservation relating to a portion of a lightpath comprising a plurality of lightpath segments coupled between network nodes in the optical switched network, including incoming and outgoing lightpath segments coupled to the switching node apparatus;

reserving the network resource;

detecting an unavailability of the network resource after the network resource has been reserved;

generating a resource cancellation message in response to detecting the unavailability of the bandwidth resource; and

sending the resource cancellation message to at least one network node along the lightpath.

33. (Original) The machine-readable medium of claim 32 wherein execution of the instructions further performs the operations of:

canceling a resource reservation in response to receiving a resource cancellation message.

34. (Original) The machine-readable medium of claim 32, wherein the optical burst-switched network comprises a photonic burst switched (PBS) network.

35. (Original) The machine-readable medium of claim 34, wherein the optical burst switching network comprises a wavelength-division multiplexed (WDM) PBS network; and the optical switching fabric provides switching of optical signals comprising different wavelengths carried over common fibers that may be respectively coupled to said at least one input fiber port and said at least one output fiber port.

36. (Original) The machine-readable medium of claim 34, wherein the resource reservation request is sent via a PBS control burst, and the resource cancellation message is included as part of a resource cancellation control burst having a format similar to the PBS control burst.
37. (Original) The machine-readable medium of claim 32, wherein reserving the bandwidth resource comprises storing resource reservation data in a resource reservation table.
38. (Original) The machine-readable medium of claim 32, wherein detecting an unavailability of the reserved resource comprises detecting a traffic constraint that limits access to the reserved resource.
39. (Original) The machine-readable medium of claim 32, wherein detecting an unavailability of the reserved resource comprises detecting one of a failure of the switching node apparatus or failure of one of the incoming and outgoing fiber links.
40. (Original) The machine-readable medium of claim 32, wherein the resource cancellation message is sent to a network node that is downstream from the switching node apparatus.

41. (Original) The machine-readable medium of claim 32, wherein the resource cancellation message is sent to a network node that is upstream from the switching node apparatus.